WHAT IS CLAIMED IS:

1.   An image data generating apparatus which defines an object in three-dimensional space as a group of basic-shape polygons to render the object, which includes a buffer storing data representing a luminance and a depth value corresponding to a position of each of pixels arranged in a grid on a screen, and which uses the data in the buffer and thereby generates data representative of an object-corresponding image with surfaces including ones hidden on the basis of the depth values, each depth value meaning a distance to each pixel from a visual point, the apparatus comprising:

first means for dividing an input two-dimensional image into blocks each having a prescribed number of pixels arranged in a horizontal direction and a vertical direction;

second means for assigning different block ID numbers to the respective blocks generated by the first means;

third means for generating MIP maps with different resolutions in response to each of the blocks, a maximum resolution among the different resolutions being equal to a resolution of the input two-dimensional image;

a memory storing data representative of the MIP maps generated by the third means for each of the blocks;

fourth means for receiving polygon data representing an on-screen position of a polygon, a depth value of the polygon which means a distance to the polygon from a visual point, a luminance of the polygon, and a correspondence between the polygon and positions of pixels of a two-dimensional image to be applied to the polygon;

fifth means for calculating, from the polygon data received by the fourth means, a block ID number corresponding to a desired MIP map

among the MIP maps generated by the third means which is to be applied to the polygon, an intra-MIP-map-block position of the desired MIP map, and a resolution of the desired MIP map;

sixth means for reading, from the memory, data representative of the desired MIP map in response to the block ID number, the intra-MIP-map-block position, and the resolution calculated by the fifth means;

seventh means for calculating a luminance of each pixel in a final image in which the desired MIP map represented by the data read from the memory is applied to the polygon for each pixel position; and

eighth means for outputting data representative of each pixel luminance calculated by the seventh means.

2.   An image data generating apparatus comprising:

first means for dividing an input two-dimensional image into blocks each having a prescribed number of adjacent pixels;

second means for generating a group of MIP maps with different resolutions in response to each of the blocks;

a first memory in which data representative of each of the MIP map groups generated by the second means are stored in successive addresses;

a second memory;

third means for transferring data representative of one among the MIP map groups from the first memory to the second memory;

fourth means for selecting at least one among the MIP maps in the group represented by the data in the second memory in response to each on-screen pixel position related to an object to be rendered; and

fifth means for using the MIP map selected by the fourth means on a pixel-by-pixel basis in rendering the object.

3.   An image data generating apparatus comprising:

first means for dividing an input two-dimensional image into blocks each having a prescribed number of adjacent pixels;

5   second means for assigning different block ID numbers to the respective blocks generated by the first means;

third means for generating MIP maps with different resolutions in response to each of the blocks;

a memory storing data representative of the MIP maps generated by

10   the third means for each of the blocks at successive addresses, the MIP maps for each of the blocks composing a MIP map block;

fourth means for receiving polygon data representing an on-screen position of each pixel in a polygon, a depth value of the pixel in the polygon which means a distance to the pixel in the polygon from a visual point, a

15   luminance of the pixel in the polygon, and a correspondence between the pixel in the polygon and positions of pixels of a two-dimensional image to be applied to the polygon;

fifth means for calculating, from the polygon data received by the fourth means, a block ID number corresponding to a desired MIP map

20   among the MIP maps generated by the third means which is to be applied to the polygon, an intra-MIP-map-block position of the desired MIP map, and a resolution of the desired MIP map;

sixth means for reading, from the memory, data representative of the desired MIP map in response to the block ID number, the

25   intra-MIP-map-block position, and the resolution calculated by the fifth means;

seventh means for calculating a color intensity of each pixel in a final image in which the desired MIP map represented by the data read from the

memory is applied to the polygon for each pixel position; and

eighth means for outputting data representative of each pixel color intensity calculated by the seventh means.

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